

***NATIONAL WEATHER SERVICE WESTERN REGION SUPPLEMENT 20-2003
APPLICABLE TO NWSI 10-513
MARCH 15, 2006***

***Operations and Services
Public Weather Services, NWSPD 10-5
WFO Winter Weather Products Specification, NWSI 10-513
WESTERN REGION WINTER WEATHER PRODUCTS***

NOTICE: This publication is available at: <http://www.nws.noaa.gov/directives/>.

OPR: W/WR1x2 (C. Schmidt)
Type of Issuance: Routine

Certified by: W/WR1 (R. Douglas)

SUMMARY OF REVISIONS: This supplement supersedes Western Region Supplement 20-2003 to Instruction 10-513, dated January 4, 2005. Revisions include:

Section 3: Simplified heavy snow criteria section.

Section 3.2: Added additional guidance to Winter Storm Warning description.

Section 3.3: Advisory section updated to specify use of Winter Weather Advisory.

Section 4.1: Headline section greatly reduced due to automatic generation of headlines by GHG.

Section 4.2.1: Attribution statement section added.

Section 4.3: Added guidance on updating products before product expiration time.

Removed old section 4.1 (overview...not needed) and 5 (verification...covered in another supplement)

Appendix: New examples added

Signed _____ 02/28/06
Vickie Nadolski Date
Director, Western Region

<u>Table of Contents:</u>	<u>Page</u>
1. Description	3
1.1 Forecaster Judgement	3
2. Products	3
2.1 Product Types and Appropriate Lead Times	3
2.2 Relationship to NPW	4
2.2.1 Combined Wind and Snow Events	4
2.3 Relationship to NOW	4
3. Criteria	4
3.1 Heavy Snow	4
3.1.1 Snow Amount Forecasts	5
3.1.2 Snow Advisory Criteria	5
3.2 Winter Storm and Blizzard Warnings	5
3.3 Winter Weather Advisories	6
3.4 Watches	6
3.5 Wind Chill	6
3.5.1 Wind Chill Warnings	6
3.5.2 Wind Chill Advisories	6
4. Product Format	6
4.1 Headlines	6
4.2 Segment Content	7
4.2.1 Attribution Statements	7
4.2.2 Call-to-Action Statements	7
4.3 Product Expiration and Updates	7
4.4 Event Expiration Statements	7

Appendix

A. Examples of WSW Products	A-1
-----------------------------------	-----

1. Description. Hazardous winter weather is addressed by Western Region (WR) Weather Forecast Offices (WFOs) by issuing winter weather outlooks, watches, warnings, and advisories when conditions are expected to meet established criteria that pose a threat to people in the County Warning and Forecast Area (CWFA). Winter weather that does not meet hazardous criteria should be addressed in products such as the Short Term Forecast (AWIPS header NOW) or Special Weather Statement (AWIPS header SPS).

1.1 Forecaster Judgement. Written instructions cannot address every operational situation. All WFO personnel must exercise initiative and professional judgement to minimize risk to public safety and property in situations not explicitly covered by written instructions. Personnel must balance safety and needs of customers against frequency of warnings and possible constraint of travel and commerce. Protection of life and property shall take precedence in these decision making processes. As such criteria for winter storm warnings are considered guidance only, not strict thresholds. Forecasters may issued warnings based upon lower criteria if the event in question poses a significant threat to life due to timing or other circumstances. For example, an advisory would be appropriate for a minor snowfall event that takes place near rush hour, even if the amount may not meet strict criteria.

2. Products. Outlooks for potentially hazardous winter weather will be included in the Hazardous Weather Outlook (AWIPS header HWO). Outlooks can also be issued as separate Special Weather Statements (SPS) as stated in NWSI 10-513, but these statements should be reserved for major storms, big changes to the current weather pattern, and other circumstances in which the forecaster believes should receive heightened awareness of the upcoming storm.

Watches, warnings, and advisories for winter weather hazards are issued under the category WSW, and are referenced in the appropriate section of the HWO. Each of these products uses the modernized site ID for the appropriate WFO in the AWIPS header. See <http://ww2.wrh.noaa.gov/public/WMOheaders/warningprods.htm> for a full list of WMO and AWIPS IDs for WR winter weather products.

2.1 Product Types and Appropriate Lead Times.

- a. Outlooks. Outlooks are issued in the HWO for potential hazards which may develop in the Day 3-7 period of the forecast. An SPS (titled “Special Weather Statement” with a headline highlighting the upcoming storm) may be issued for events where significant hazards are possible as discussed above. It is appropriate to include non-warning/advisory conditions in the HWO if those conditions could pose a significant threat to the public if they are not prepared.
- b. Watches. Watches are issued when the risk of a hazardous weather event is significant in the 12 to 48 hour time frame, but occurrence, location, severity, and/or timing is uncertain. Watches may be issued beyond 48 hours for large synoptic scale storms, but care must be used so that we do not reduce the effectiveness of watches by issuing too many false alarms.

- c. Warnings. Warnings are issued when an event meeting established criteria is occurring, imminent, or has a significant probability of occurrence within 36 hours. Warnings may be issued beyond 36 hours for large synoptic scale storms, but care must be used so that we do not reduce the effectiveness of warnings by issuing too many false alarms.
- d. Advisories. Advisories are issued for certain events that have a significant probability of occurrence in the first 36 hours. These events are defined as non life-threatening by themselves, but they could become life-threatening if caution is not exercised.

2.2 Relationship to NPW. High wind watches/warnings and wind advisories will not be issued within WSWs. Issue all high wind watches/warnings/advisories as their own NPW product. Winter weather warnings/advisories will not be combined with non-precipitation hazards in the NPW product at any time.

2.2.1 Combined Wind and Snow Events. If strong winds will be in the same zones as winter precipitation that meets criteria, issue Blizzard/Winter Storm Warnings or Snow and Blowing Snow Advisory rather than separate WSW and NPW.

2.3 Relationship to NOW. Both hazardous and non-hazardous winter weather may be addressed in the Short Term Forecast (NOW). When locally-established criteria for winter weather are met, NOWs should be issued to relay information for approximately the one to three hour time frame. When winter weather warnings or advisories are in effect, the appropriate headlines should be included in the NOW. NOWs should contain detailed information on timing and location (i.e., use “snow will end south of highway 224 by 7 pm” rather than “snow ending south this evening”).

3. Criteria. Criteria for winter weather watches/warnings/advisories will consider climatology and customer needs, and reflect a balance between public safety and too many false alarms. Customers, emergency management officials, concerned federal, state and local government agencies, the media, Western Region Headquarters (MSD), and all other appropriate groups must be aware of WFOs criteria for winter weather watches, warnings, and advisories. Awareness must be maintained with these local customers and partners awareness through regular outreach, and those groups with the most at stake should have input into the process of choosing criteria as it affects their operations.

The State Liaison Office MIC (SLOMIC) will coordinate all criteria with MICs of WFOs within his/her state to ensure consistency for climatologically similar areas, keeping in mind those separated by state or county borders. To aid the coordination of warning and advisory criteria in adjacent CWAs, WFOs will post their winter weather watch/warning/advisory criteria in their SDM on the MSD intranet site <http://sdm.wr.noaa.gov>.

3.1 Heavy Snow. Climatic and topographic variability across the west make it difficult to establish relevant heavy snow criteria with consistent snow amount-elevation relationships. Western Region includes mountain ranges such as the Rockies, the Sierra Nevada, and the

Cascades which receive 500 or more inches of snow annually. In areas where snow is not common, such as in population centers at low elevations, public safety can be seriously impacted with even the slightest snow accumulation.

Taking into account the climatic and geographic variability described above, basic heavy snow criteria in Western Region will be defined as follows: Where snow is considered common, four inches or more in 12 hours or six inches or more in 24 hours.

In addition, considerable flexibility is given to local WFOs to define heavy snow criteria within their CWFA. To avoid abrupt differences in heavy snow criteria between adjacent CWFAs, MICs will coordinate their heavy snow criteria, and applicable elevation ranges, with the state liaison office (SLO) and neighboring WFOs.

3.1.1 Snow Amount Forecasts. The decision to issue a warning should be based, in addition to the mid point value method listed in 10-513 section 5.2.2.2, on the average amount of snow expected to affect the majority or most relevant portion of the forecast area. In zones where the population is well dispersed and winter weather will have a similar effect across the entire zone, the midpoint of the expected snowfall may be used to determine whether to issue a warning. In zones where the population is mostly confined to a small area within the zone, also consider the effect the snow will have on the population when making the warning decision. In mountains, use the snow amount that will most affect passes, roads and people, rather than that expected to fall at a remote point on a peak. Forecasters must balance public safety and the frequency of warnings/advisories in determining whether the threat requires heightened attention.

3.1.2 Snow Advisory Criteria. MICs, in coordination with Emergency Management customers and adjacent WFOs, will determine and document local criteria governing the issuance of winter weather advisories. This can include the option NOT to issue certain types of advisories as deemed appropriate when considering climatology and other factors. WFOs will post their winter weather advisory criteria in their SDM on the MSD intranet site <http://sdm.wr.noaa.gov>.

3.2 Winter Storm and Blizzard Warnings. A Winter Storm Warning may be issued when two or more predominant hazards are expected during a storm, including snow, ice, sleet, and/or wind, and blowing snow (below blizzard conditions), and wind chill. This includes heavy snow along with enough wind to produce blowing and drifting snow, even if the wind itself does not meet warning criteria. A Winter Storm Warning is also appropriate for a storm that contains wind meeting high wind criteria combined with light to moderate snowfall; the combination of wind and snow results in blowing and drifting snow with low visibility; making conditions extremely hazardous. When issuing a Winter Storm Warning for snow and wind, make sure the appropriate wind speeds and resulting hazards are included in the text of the product.

The principal difference between a Blizzard Warning and a Winter Storm Warning for snow and wind is the severity of low visibility; a blizzard contains visibilities frequently below 1/4 miles for three hours or more.

If only one predominant hazard is forecast, issue the appropriate warning as listed in 10-513 (ie, if only snow accumulation is the main hazard, issue a Heavy Snow Warning instead of a Winter Storm Warning).

3.3 Advisories. Issue the appropriate winter weather advisory based on the hazard expected to meet advisory criteria as specified in NWSI 10-513. A Winter Weather Advisory is appropriate when two or more precipitation hazards are expected during a storm (snow, ice, and/or sleet), or if the threat for multiple hazards exists and it is not yet clear which is going to be most predominant. If snow and wind are the expected hazards meeting advisory criteria, issue a Snow and Blowing Snow Advisory, not a Winter Weather Advisory.

3.4 Watches. Winter weather watch criteria are the same as warning criteria. However, when an advisory is issued following a watch, do not use the words “downgraded” to describe the advisory.

3.5 Wind Chill. Dangerous wind chill is defined by NWS as the effective temperature (wind chill index, per WMO [2001]) at which the health and well being of people is put in serious jeopardy. The effective temperature is dependent on ambient air temperature, wind speed, and exposure. A Wind Chill Warning or Advisory should include information on the time to frostbite at the predicted wind speeds and temperatures. A table of wind chill values is available in 10-513.

3.5.1 Wind Chill Warnings. A Wind Chill Warning will be issued when wind chill index temperatures are expected to drop below a locally determined effective temperature threshold (usually **-20°F to -40°F**) for more than one hour, with wind speed at least 10 mph. The exact criteria for both temperature and duration are set locally.

3.5.2 Wind Chill Advisories. A Wind Chill Advisory is optional and criteria should be established locally. When establishing wind chill advisory criteria, consider the climatological range and frequency of combined wind and cold events that pose potential danger for unprepared citizens.

4. Product Format. WSWs are segmented products. Format details are well described in Instruction 10-513.

4.1 Headlines. Headline standardization is extremely important nationally and policy stated in 10-513 must be followed at all times. Graphical Hazard Generator (GHG) software will produce the appropriate headline based on national policy, and must be used for all WSW products. GHG currently “locks” the headline parameters so they will match the corresponding VTEC Code. WR WFOs are permitted to add information to the end of the headline to account for further definition of the hazard.

i. Elevation: WR WFOs may include elevation in the headline as necessary at the end of the headline. (e.g., “...HEAVY SNOW WARNING IN EFFECT UNTIL 6 AM TUESDAY ABOVE 7000 FEET...”).

ii. Area: To meet local customer requirements, an areal descriptive term may be included at the end of the headline. (e.g., "...ICE STORM WARNING REMAINS IN EFFECT UNTIL 10 PM FRIDAY FOR *THE COLUMBIA GORGE*...")

4.2 Segment Content. Within each segment the free text description of the event will be concise and restricted to addressing the specifics of the weather that is expected. Where appropriate, include mention of specific highways or other geographic locations where the public would be especially vulnerable. A definition of watch/warning must be included as shown in 10-513 if the event has not yet begun.

4.2.1 Attribution Statement. The attribution statement (THE NATIONAL WEATHER SERVICE IN [WFO LOCATION] HAS ISSUED A...) is required for the first issuance of a particular watch/warning/advisory. However, GHG produces this statement for all issuances of a winter weather product, and keys off of this statement to capture text for subsequent issuances. WFOs are encouraged to leave this statement in all winter weather products as generated by GHG to facilitate the update process.

4.2.2 Call-to-Action Statements. Concise call-to-action statements should be included in each segment if the statements relay extremely urgent messages, such as potentially life-saving actions. Other less urgent call-to-action statements may be included in one of three ways: either separated from other content within a segment by using the && separator; included as part of the overview; or grouped together after the \$\$ ending the final segment of the product. WFOs must remember that call-to-action statements not included in the segments will not be received by customers who program their systems to only receive their local segments.

4.3 Product Expiration and Updates. With the implementation of VTEC in WSW products, customers are using more automated means to disseminate winter weather information. It is imperative that all WSW products be updated before the Product Expiration Time (the time at the end of the UGC line) is reached. This time is NOT the expiration time of the actual hazard, but rather the time by which a customer can expect an updated product. If an update is not sent before the Product Expiration Time, many dissemination systems will "drop" the event and may not properly process the update.

4.4 Event Expiration Statements. WR WFOs should issue a final statement when a warning or advisory will be allowed to expire at its normal expiration time and has not been previously canceled. A short statement should be issued from 30 minutes before to 30 minutes after the event expiration time stating that the hazard will end or has ended.

APPENDIX A

See also the examples contained in Appendix A of NWSI 10-513.

Example 1: (Winter Storm Watch upgraded to Warning in first segment; second segment is Warning issued for area not covered in the Watch)

WWUS45 KBOI 070041
WSWBOI

URGENT - WINTER WEATHER MESSAGE
NATIONAL WEATHER SERVICE BOISE ID
541 PM MST SUN NOV 6 2005

...PROLONGED SNOW ABOVE 5000 FEET...

.MOISTURE CONTINUES TO STREAM INLAND FROM THE PACIFIC ON VERY STRONG SOUTHWEST WINDS ALOFT. THE MOISTURE CORE WILL REMAIN STATIONARY ACROSS THE CENTRAL IDAHO MOUNTAINS UNTIL LATE MONDAY NIGHT WHEN A COLD FRONT WILL USHER IN DRIER AIR. SNOW WILL CONTINUE ABOVE 5000 FEET THROUGH MONDAY NIGHT RESULTING IN HEAVY ACCUMULATIONS ESPECIALLY ON WINDWARD WEST-FACING SLOPES.

IDZ011-071245-
/O.UPG.KBOI.WS.A.0002.051107T1800Z-051108T1200Z/
/O.NEW.KBOI.HA.W.0002.051107T0041Z-051108T1200Z/
WEST CENTRAL MOUNTAINS-
541 PM MST SUN NOV 6 2005

...HEAVY SNOW WARNING IN EFFECT UNTIL 5 AM MST TUESDAY ABOVE 5000 FEET...

THE NATIONAL WEATHER SERVICE IN BOISE HAS ISSUED A HEAVY SNOW WARNING...WHICH IS IN EFFECT UNTIL 5 AM MST TUESDAY. THE WINTER STORM WATCH IS NO LONGER IN EFFECT.

SNOW WILL FALL CONTINUOUSLY THROUGH MONDAY NIGHT WITH ACCUMULATION OF 12 TO 24 INCHES EXPECTED ABOVE 5500 FEET. THE LARGEST AMOUNTS WILL OCCUR ON WEST FACING SLOPES. ALSO 6... TO 12 INCHES OF ACCUMULATION IS EXPECTED BETWEEN 5000 AND 5500 FEET. BELOW 5000 FEET...RAIN WILL BE MIXED WITH THE SNOW AND ONLY MINOR SNOWFALL ACCUMULATION IS EXPECTED.

A HEAVY SNOW WARNING MEANS SEVERE WINTER WEATHER CONDITIONS ARE EXPECTED OR OCCURRING. SIGNIFICANT AMOUNTS OF SNOW ARE FORECAST THAT WILL MAKE TRAVEL DANGEROUS. ONLY TRAVEL IN AN EMERGENCY. IF YOU MUST TRAVEL...KEEP AN EXTRA FLASHLIGHT...FOOD...AND WATER IN YOUR VEHICLE IN CASE OF AN EMERGENCY.

\$\$

IDZ013-071245-
/O.NEW.KBOI.HS.W.0002.051107T0041Z-051108T1200Z/
BOISE MOUNTAINS-
541 PM MST SUN NOV 6 2005

...HEAVY SNOW WARNING IN EFFECT UNTIL 5 AM MST TUESDAY ABOVE 5500 FEET...

THE NATIONAL WEATHER SERVICE IN BOISE HAS ISSUED A HEAVE SNOW WARNING...WHICH IS IN EFFECT UNTIL 5 AM MST TUESDAY.

NWS WR SUPP 20 MARCH 15, 2006

SNOW WILL FALL CONTINUOUSLY THROUGH MONDAY NIGHT WITH ACCUMULATION OF 12 TO 24 INCHES EXPECTED ABOVE 5500 FEET. THE LARGEST AMOUNTS WILL OCCUR ON WEST FACING SLOPES. ALSO...6 TO 12 INCHES OF ACCUMULATION IS EXPECTED BETWEEN 5000 AND 5500 FEET. BELOW 5000 FEET...RAIN WILL BE MIXED WITH THE SNOW AND ONLY MINOR SNOWFALL ACCUMULATION IS EXPECTED.

A HEAVY SNOW WARNING MEANS SEVERE WINTER WEATHER CONDITIONS ARE EXPECTED OR OCCURRING. SIGNIFICANT AMOUNTS OF SNOW ARE FORECAST THAT WILL MAKE TRAVEL DANGEROUS. ONLY TRAVEL IN AN EMERGENCY. IF YOU MUST TRAVEL...KEEP AN EXTRA FLASHLIGHT...FOOD...AND WATER IN YOUR VEHICLE IN CASE OF AN EMERGENCY.

\$\$

Example 2: (Update of a Blowing Snow Advisory, extension in time)

WWUS45 KBYZ 150250
WSWBYZ

URGENT - WINTER WEATHER MESSAGE
NATIONAL WEATHER SERVICE BILLINGS MT
750 PM MST MON NOV 14 2005

.STRONG WINDS AND SNOW WILL CONTINUE OVER THE AREA THROUGH EARLY TUESDAY MORNING. BLOWING SNOW MAY REDUCE VISIBILITIES TO UNDER ONE MILE AT TIMES.

MTZ031>033-036-037-058-151100-
/O.EXT.KBYZ.BS.Y.0001.000000T0000Z-051115T1100Z/
NORTHERN ROSEBUD-CUSTER-FALLON-POWDER RIVER-CARTER-
SOUTHERN ROSEBUD-
INCLUDING THE CITIES OF...COLSTRIP...FORSYTH...MILES CITY...
BAKER...BROADUS...EKALAKA...LAKE DEER
750 PM MST MON NOV 14 2005

...BLOWING SNOW ADVISORY NOW IN EFFECT UNTIL 4 AM MST TUESDAY...

THE BLOWING SNOW ADVISORY IS NOW IN EFFECT UNTIL 4 AM MST TUESDAY.

LIGHT SNOW WILL CONTINUE OVERNIGHT ACCUMULATING 1 TO 2 INCHES BY EARLY TUESDAY MORNING. IN ADDITION TO SNOW...STRONG NORTHWEST WINDS OF 25 TO 35 MPH WILL PERSIST THROUGH EARLY TUESDAY MORNING...CAUSING SIGNIFICANT BLOWING AND DRIFTING OF SNOW AND REDUCING VISIBILITIES TO UNDER ONE MILE AT TIMES.

\$\$

Example 3: (Expiration Statement)

WWUS45 KSLC 150307
WSWSLC

URGENT - WINTER WEATHER MESSAGE
NATIONAL WEATHER SERVICE SALT LAKE CITY UT
807 PM MST MON NOV 14 2005

WYZ021-150415-
/O.EXP.KSLC.SB.Y.0001.000000T0000Z-051115T0300Z/
SOUTHWEST WYOMING-
807 PM MST MON NOV 14 2005

NWS WR SUPP 20 MARCH 15, 2006

...SNOW AND BLOWING SNOW ADVISORY HAS EXPIRED...

THE SNOW AND BLOWING SNOW ADVISORY FOR THE SOUTHWEST WYOMING IS NO LONGER IN EFFECT.

ISOLATED SNOW SHOWERS WILL TAPER OFF THIS EVENING AND THE WIND WILL CONTINUE TO DECREASE.

\$\$

UTZ007>009-150415-
/O.EXP.KSLC.SN.Y.0002.000000T0000Z-051115T0300Z/
WASATCH MOUNTAINS I-80 NORTH-WASATCH MOUNTAINS SOUTH OF I-80-
WESTERN UINITA MOUNTAINS-
807 PM MST MON NOV 14 2005

...SNOW ADVISORY HAS EXPIRED...

THE SNOW ADVISORY FOR THE WASATCH RANGE AND THE WESTERN UINITA MOUNTAINS HAS EXPIRED AT 8 PM MST THIS EVENING.

HEAVY SNOW HAS TAPERED TO ISOLATED SNOW SHOWERS THIS EVENING. ADDITIONAL ACCUMULATIONS THIS EVENING WILL BE LESS THAN 1 INCH.

WINDS ACROSS THE HIGHER ELEVATIONS WILL GRADUALLY DECREASE TONIGHT...BUT GUSTS TO 35 MPH WILL CONTINUE THIS EVENING.

SNOWFALL ACROSS THE MOUNTAINS SINCE SUNDAY RANGED FROM 8-15 INCHES ABOVE 7500 FEET.

\$\$